

# Miguel Costas Piñó

Curriculum Vitae, updated September 28, 2016

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Birth date: 11.28.1987



## Education

- 2011–2016 **PhD. in Civil Engineering, area of Continuum Mechanics and Structural Theory**, *School of Civil Engineering*, University of A Coruña.  
Doctoral thesis: *Crashworthiness analysis and design optimization of hybrid impact energy absorbers* Research stay at SIMLab (NTNU) during six months, granted by Fundación Barrié. International mention and *cum laude* award.
- 2005–2010 **MEng. in Civil Engineering (Ingeniero de Caminos, Canales y Puertos)**, *School of Civil Engineering*, University of A Coruña.  
Number 11 of 95 in class. Erasmus exchange program at Syddansk Universitet (Odense, Denmark).
- 2005 **Professional degree in Music**, *Conservatory of Santiago de Compostela*.  
Specialization in piano and music analysis.

## Work history

- 2016–Present **Postdoctoral researcher**, *Structural Mechanics group*, University of A Coruña.
- 2011–2015 **RD engineer and PhD candidate**, *Structural Mechanics group*, University of A Coruña.  
(Please find a list of RD projects on the upcoming pages).
- Summer of 2009 **Internship**, *Port Authority of Vilagarcía de Arousa (Puertos del Estado)*.  
Support tasks at the infrastructures management board.

## Teaching experience

- Academic year 2015–2016 **Teacher of 'Advanced structural analysis' in the Master in Structural and Material Aerospace Engineering**, *School of Civil Engineering*, University of A Coruña.
- Academic year 2013–2014 **Assistant in the practical training of the subject 'Bridges 1'**, *School of Civil Engineering*, University of A Coruña.

## Languages

- Spanish **Native**
- Galician **Native**
- English **Full professional proficiency, level C1** *Certificate in Advanced English, Cambridge University. 2012.*
- French **Basic professional proficiency, level B1**
- Portuguese **Basic professional proficiency**
- Norwegian **Basic skills** *Official A1 certificate (Bokmål)*

## Computation skills

- Structural analysis Structural analysis with Abaqus Standard and Explicit. Experience in explicit crash simulations, including plasticity and failure models for metals and composites, contacts, joints, etc. Experience with Python scripts for pre and post-processing. Other software: Ansys, SAP2000, Cosmos/M.
- Optimization packages Experience in structural optimization with different optimization libraries such as DOT, SCOLIB, CONMIN, OPT++ and JEGA. Surrogate modeling using the Surfpack package. Experience with DAKOTA optimization framework.
- CAD Autocad
- Programming Python, Fortran, Bash, L<sup>A</sup>T<sub>E</sub>X.

## Other information

- Driving license. Car owner.
- Piano teacher and active professional concert pianist.

## Patents

- National Spanish patent no. ES 2-386-269-B1: Hybrid metal-composite system for crash energy absorption. Authors: Alberto Tielas, Isabel Álvarez, Raquel Ledo (Centro Tecnológico da Automoción de Galicia, CTAG); Miguel Costas, Luis Esteban Romera (University of A Coruña, UDC). Granted on the 11th of July 2013.

## Participation in RD projects

- [European project] FP7-AAT-2007-RTD-1. MAAXIMUS: More affordable Aircraft Structure through Extended, Integrated and Mature Numerical Sizing, UE, 03/2008-03/2013. Years 2011-2015. Budget: 370000 €.
- [National project] UNCL13-1E-2123. Boundary layer wind tunnel for civil and aeronautical engineering applications. Spanish Ministry of Economy and Competitiveness. Year 2014. Budget: 325000 €.
- [National project] DURAPORT. New technologies for the construction of durable port infrastructure. CDTI, program FEDER-INTERCONNECTA, Spanish Ministry of Economy and Competitiveness, ref. 407. Years 2011-2012. Budget: 40000 €.
- [National project] DPI 2013-41893-R. OPTOPAER. Probabilistic topologic and topometric optimization of aeronautical structures in linear and nonlinear regimes. Spanish Ministry of Economy and Competitiveness. Years 2014-2016. Budget: 53240 €.
- [Regional project] 09DPI-011118PR INCITE 2009. Optimum design of automobile structures and components with metallic and composite materials. Regional Counseling of Economy and Industry. Years 2009-2012. Budget: 45000 €.
- [Regional project] 10DPI025CT. Hybrid-Body: structural optimization of a hybrid sistem for frontal impact energy absorption with experimental and numerical validation. Regional Counseling of Economy and Industry. Years 2010-2012. Budget: 46000 €.
- [Regional project] GRC2013-056. Group of Competitive Reference. Regional Counseling of Culture, Education and Universities. Years 2013-2016. Budget: 259000 €.
- [RD project with industrial partner] With Puentes y Calzadas: Seismic design in linear and nonlinear regimes of the new bridge over the river Chiche, in Ecuador. Ref. 443. Year 2013. Budget: 44504.77 €.
- [RD project with industrial partner] With AIRBUS: Optimization study of rear fuselage. Year 2015. Budget: 25561.26 €.
- [RD project with industrial partner] With AIRBUS: Junction modeling of nonlinear frequency response of assembled structures. Extension of 2012 activities. Year 2015. Budget: 24200 €.

## RD fundraising

- [National project] DPI2016-76934-R. Probabilistic optimization of intact and damaged aeronautical structures under dynamic and impact loading. Spanish Ministry of Economy and Competitiveness. Year 2016. Budget: 111600 €.

## Publications

### Research articles in JCR journals.

M. Costas, D. Morin, M. Langseth, L. Romera, and J. Díaz. Axial crushing of aluminum extrusions filled with PET foam and GFRP. An experimental investigation. *Thin-Walled Structures*, 99:45–57, 2016.

J Paz, J Díaz, L Romera, and M Costas. Size and shape optimization of aluminum tubes with GFRP honeycomb reinforcements for crashworthy aircraft structures. *Composite Structures*, 133:499–507, 2015.

M. Cid Montoya, M. Costas, J. Díaz, L. E. Romera, and S. Hernández. A multi-objective reliability-based optimization of the crashworthiness of a metallic-GFRP impact absorber using hybrid approximations. *Structural and Multidisciplinary Optimization*, 52(4):827–843, 2015.

J. Paz, J. Díaz, L. Romera, and M. Costas. Crushing analysis and multi-objective crashworthiness optimization of GFRP honeycomb-filled energy absorption devices. *Finite Elements in Analysis and Design*, 91:30 – 39, 2014.

M. Costas, J. Díaz, L. Romera, and S. Hernández. A multi-objective surrogate-based optimization of the crashworthiness of a hybrid impact absorber. *International Journal of Mechanical Sciences*, 88:46–54, 2014.

M. Costas, J. Díaz, L. E. Romera, S. Hernández, and A. Tielas. Static and dynamic axial crushing analysis of car frontal impact hybrid absorbers. *International Journal of Impact Engineering*, 62:166–181, 2013.

### **International conferences.**

J. Díaz, L. E. Romera, M. Costas, and J. Paz. Reliability-based crashworthiness optimization of hybrid metal-composite energy absorption devices. In *ICCS19 - 19th International Conference on Composite Structures, Porto (Portugal)*, 2016.

M. Costas, J. Díaz, L. E. Romera, D. Morin, and M. Langseth. Experimental characterization and numerical multi-objective optimization of the crashworthiness of aluminum extrusions filled with PET foam and GFRP. In *1st International Conference on Impact Loading of Structures and Materials (ICILSM), Turin (Italy)*, 2016.

L. Romera, M. Costas, J. Díaz, J. Paz, and S. Hernández. Reduction of the frontal crash peak forces in a car using size optimization tools. In *35th FISITA World Automotive Congress, Maastrich (Netherlands)*, 2014.

J. Díaz, M. Costas, L. Romera, J. Paz, and S. Hernández. Surrogate-based multi-objective optimization of glass-fiber - steel crash absorbers. In *35th FISITA World Automotive Congress, Maastrich (Netherlands)*, 2014.

L. Romera, S. Hernández, M. Costas, A. Balomir, and P. Ouro. Assessment of seismic behaviour of portal bridges with double friction pendulum bearings. In *7th IABSE Symposium, Madrid (Spain)*, 2014.

L. Romera, J. Paz, M. Costas, J. Díaz, and S. Hernández. Crashworthiness response of honeycomb metallic-GFRP energy absorption devices. In *HPSM/OPTI 2014, The 2014 International Conference on High Performance and Optimum Design of Structures and Materials*, 2014.

M. Costas, L. Romera, J. Díaz, S. Hernández, and A. Tielas. Computational and experimental analysis of a hybrid car impact absorber. In *Computational Methods and Experimental Measurements XVI, WIT Press, C.A. Brebbia, G. M. Carlomagno and S. Hernandez (eds.)*, pages 367–378, 2013.

M. Costas, J. Díaz, L. Romera, S. Hernández, and R. Ledo. Influence of welded joints on the crashworthiness response of hybrid structural elements. In *SAE 2013 World Congress and Exhibition, paper 13B-0036/2013-01-0755*, 2013.

### **Master Thesis in Structural Engineering (Syddansk Universitet, Denmark).**

M. Costas, D. Gómez, G. Vilanova, and coordinators Dr. Carsten Munk Plum and M.Sc. Lys Rhilinger. *Load Bearing Capacity of Circular Hollow Sections Subjected to Combined Bending and Axial Compression*. Master's thesis, Tekniske Fakultet, Syddansk Universitet - Denmark, 2010.

### **International research stays**

- Research stay from 1/10/2014 to 1/4/2015 (six months) at the Structural Impact Laboratory (NTNU, Norway) supervised by Prof. Magnus Langseth and Dr. David Morin.

### **Scientific advisory**

- Reviewer in JCR journals *International Journal of Mechanical Sciences*, *Materials and Design*, *Journal of Reinforced Plastics and Composites*, *Engineering Optimization*, *Computers and Structures* and *Composites Part B*.